

and the center reached the Mississippi River, between Cairo and St. Louis, by the evening of the 28th. On the morning of the 29th the center was over Ohio, where it remained nearly stationary, with diminishing strength, until the close of the month. No general storms of marked intensity occurred on the Pacific coast.

During the third decade of the month severe local storms, heavy rain, and high winds occurred in parts of the Lake region and the Ohio and middle and upper Mississippi valleys. In Missouri and Illinois crops were damaged by heavy rains.

The noteworthy frosts of the month occurred in the North Atlantic States on the 10th and in the Northwestern States on the 20th.

Ample warning was given of the general storms that visited the coasts and Great Lakes.

BOSTON FORECAST DISTRICT.

The only conspicuous features of the month were the moderate gales of the 7th, 9th, and 10th, for which warnings were displayed, and the general and severe frost of the 10th, which was announced in the morning forecast of the 9th—*J. W. Smith, Forecast Official.*

NEW ORLEANS FORECAST DISTRICT.

The third decade of the month was stormy, and the severest weather resulted from the Gulf storm of the 26-27th, in connection with which ample and timely warnings were issued.—*I. M. Cline, Forecast Official.*

CHICAGO FORECAST DISTRICT.

Storm warnings were ordered on the three upper lakes on the morning of the 25th, and on Lakes Michigan and Huron during the afternoon of the 28th. The storm of the 25th was not severe. The second storm, that had moved from the western Gulf of Mexico, was very severe over the southern part of the Lake region. An extensive frost, for which warnings were issued, occurred in the Northwestern States on the morning of the 20th. The month was marked by an unusual amount of rainfall over almost the entire district, and abnormally cool weather during the last half of the month, and these conditions were generally forecast.—*H. J. Cox, Professor.*

DENVER FORECAST DISTRICT.

No special warnings were issued during the month.—*F. H. Brandenburg, Forecast Official.*

SAN FRANCISCO FORECAST DISTRICT.

The weather of the month was not marked by notable abnormal features and no special warnings were issued.—*A. G. McAdie, Professor.*

PORTLAND, OREG., FORECAST DISTRICT.

The rainfall was deficient, and light frost, for which warnings were issued, occurred on several mornings.—*E. A. Beals, Forecast Official.*

RIVERS AND FLOODS.

Fairly good navigable stages of water prevailed in the principal rivers of the United States during the month of June, especially in the Mississippi and its western tributaries. Except from St. Paul, Minn., to Dubuque, Iowa, where there was very little change, the mean stages of the Mississippi were considerably higher than those of the preceding month, the excess being most notable from Galland, Iowa, to Vicksburg, Miss. In the Missouri River the mean stages, at all points from which reports were received, averaged about four feet higher than during May, and on the 11th of the month the danger lines were nearly reached at St. Joseph and Kansas City, Mo. The eastern tributaries of the Mississippi were generally lower than at the close of May, the changes being slight in the Ohio and Tennessee rivers, but more pronounced in the Cumberland. Slight floods occurred in the upper portion of the Red River from the 1st to the 7th, and the danger lines were reached or exceeded during the month in the Pedee, Wateree, and Willamette rivers, but little if any damage resulted to growing crops or other property.

The highest and lowest water, mean stage, and monthly range at 138 river stations are given in Table VII. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are: Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*George E. Hunt, Chief Clerk Forecast Division.*

AREAS OF HIGH AND LOW PRESSURE.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocity.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	Miles.	Days.	Miles.	Miles.
I.....	3, a.m.	53	114	7, a.m.	32	65	3,125	4.0	781	32.5
II.....	5, p.m.	48	125	9, p.m.	39	75	2,900	4.0	725	30.2
III.....	14, p.m.	50	111	18, p.m.	32	65	2,800	4.0	700	29.2
IV.....	19, a.m.	52	122	24, a.m.	37	76	3,325	5.0	666	67.7
Sums.....							12,150	17.0	2,871	119.6
Mean of 4 paths.....							3,038		718	29.9
Mean of 17 days.....									715	29.8
Low areas.										
I.....	*31, a.m.	39	120	5, a.m.	47	54	4,000	5.0	800	33.3
II.....	4, p.m.	47	112	9, a.m.	46	60	3,025	4.5	672	28.0
III.....	13, a.m.	23	82	18, a.m.	47	54	2,575	5.0	535	22.3
IV.....	13, p.m.	44	104				2,575	4.5	572	23.8
V.....	16, a.m.	48	115	20, a.m.	47	65	2,550	4.0	638	26.6
VI.....	20, a.m.	85	90	21, p.m.	46	78	1,075	1.5	717	29.9
VII.....	23, p.m.	44	116	27, a.m.	48	68	2,825	3.5	807	33.6
VIII.....	24, a.m.	33	115	29, p.m.	39	75	3,200	5.5	582	24.3
	26, p.m.	28	97				1,875	3.0	625	26.0
	27, p.m.	32	106	† 1, a.m.	42	71	2,425	3.5	* 693	28.9
Sums.....							26,225	40.0	6,641	276.7
Mean of 10 paths.....							2,622		664	27.7
Mean of 40 days.....									656	27.3

* May. † July.

For graphic presentation of the movements of these highs and lows see Charts I and II.—*Geo. E. Hunt, Chief Clerk Forecast Division.*